Rev 02/07

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application	:	Eliezer Peli
Application No.	:	10/583,682
Filed	:	June 19, 2006
Confirmation No.	:	4517
For	:	PERIPHERAL FIELD EXPANSION DEVICE
Examiner	:	Darryl J. Collins
Attorney's Docket	:	ERI-141XX

TC Art Unit: 2873

* *

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on Aug. 27, 2007.

By: Holliday C. Heine
Holliday C. Heine, Ph.D.
Registration No. 34,346
Attorney for Applicant(s)

* *

DECLARATION OF ELIEZER PELI, M.Sc., O.D., UNDER 37 C.F.R. §1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Eliezer Peli, a citizen of the United States, residing at 32 Kendall Road, Newton, MA 02459, declare as follows:

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1. I hold the degrees of Master of Science from Technion-Israel Institute of Technology located in Haifa, Israel, and Doctor of Optometry from the New England College of Optometry in Boston, Massachusetts. At the present time, I hold the positions of Professor of Ophthalmology at Harvard Medical School and Senior Scientist, Moakley Scholar in Aging Eye Research at The Schepens Eye Research Institute, Inc., both located in Boston, Massachusetts.

2. My research, teaching, and clinical contributions span the interface between engineering and ophthalmic and vision research. I conduct basic and clinical research. I am trying to understand how we see in the context of low vision rehabilitation and in relation to the more general question of human vision and image display interaction. I have been able to transfer knowledge and science from health sciences to military and aviation areas and vice-versa to the benefit of all areas.

I have developed a metric for contrast in complex images that has been widely adopted. This permits quantitative specification of contrast, the most relevant visual parameter, in images. The contrast metric can also be used to simulate normal or low-vision. It was applied successfully in the development of image enhancement for the visually impaired (an area of research I pioneered), and in understanding visual function in wide field simulations.

I am studying the issue of vision and display interaction in general and the clinical aspects of head mounted displays in particular. I have made contributions to the understanding of the impact of some optical parameters on the comfort of the users and

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conducted clinical research in the evaluation of these displays. I have been applying all aspect of my basic research to the development and evaluation of novel vision aids and methods of low-vision rehabilitation, which is also my chosen area of clinical practice.

My research also includes contributions to the areas of eye movement analysis, image processing, image communications (U.S. Patent No. 5,109,282) and optics (U.S. Patent No. 6,775,060). I have been a leader in the area of image processing of retinal images, developing optical and computational methods for enhancement of clinical images and quantitative analysis ranging from measurements of retinal nerve fiber defects to the measurements of Drusen in macular degeneration. In the area of eye movements, I have contributed to the understanding of eye movement control with peripheral vision, the analysis and modification of eye movements in binocular vision disorders (U.S. Patent No. 5,026,151), and the interaction of eye movement with the perception of displayed images. In the optics field, I developed a novel fiber optics reading magnifier (U.S. Patent No. 5,511,141 and U.S. Patent No. 5,600,751), a calibration device for the confocal microscope, an adjustable spectacle lens for presbyopia and introduced the use of circular polarizers in ophthalmic imaging.

3. I am the inventor of the subject matter described and claimed in the above-identified patent application. I am also familiar with the prosecution of the present application before the United States Patent and Trademark Office.

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4. In the outstanding Office Action, the Examiner has rejected the pending claims as obvious over Onufryk (U.S. Patent No. 5,969,790), either alone or in combination with Israel (U.S. Patent No. 6,139,145), Heide et al. (U.S. Patent No. 4,575,204) or Peli et al. (U.S. Patent No. 6,775,060).

5. In my opinion, in making these rejections, the Examiner has not realized the very real differences in the effect on a wearer of a system as taught by Onufryk ('790) as compared to a system according to the claims in my application.

6. To illustrate these differences, I am enclosing two attachments herewith. Attachment A is a set of Figures I have prepared, Figs. 1-5, which will be discussed below. Attachment B is a copy of an advertising flyer from the company InWave Optics, Inc., promoting the company's "Field Expansion Prescription Eyeware." The spectacle system in the upper photograph of the flyer, entitled "Peripheral Field Loss," is a vision system based on the teachings of Onufryk ('790) and is advertised as an aid for those having retinitis pigmentosa or RP (tunnel vision). The separate system in the lower photograph of the flyer, entitled "Hemispheric Field Loss," is advertised as an aid for those having hemianopia.

7. The diagrams of Attachment A, Figs. 1-3 were prepared using a technique developed by me for simulating what is seen by a wearer of vision systems designed to aid those with vision problems, such as a visual field defect. I have also prepared the photographs of

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Figs. 4-5 to demonstrate some of these differences via photographs made through the lenses of the systems.

8. Homonymous hemianopia, the visual field defect my system is designed to correct for, is the loss of half the visual field on one side in both eyes. This condition causes difficulties with general mobility (obstacle detection and navigation) as people with homonymous hemianopia are likely to walk into obstacles on the side of the field loss, such as furniture or objects on the floor. Many people afflicted with this condition avoid busy places for fear they will bump into other people or objects.

9. Referring to Fig. 1 of Attachment A, the upper diagram shows the straight ahead view of a normally sighted person looking down a hallway. There are two single individuals in the near field, one slightly to the left and the other slightly to the right of the viewer, and a group of three individuals in the center of the view in the far field. The lower diagram represents the straight ahead view down that same hallway of a person having left hemianopia. The man in the near field on the left is not visible at all. The grey area on the left represents the area of visual field loss. (It does not appear black or grey to the afflicted person; it is just as invisible as is the field behind one's head.)

10. In Fig. 2, the upper diagram depicts what a person with left hemianopia would see down that hallway when wearing an embodiment of the system of the invention having prisms disposed in the lower peripheral viewing area, such as claimed in claim 3. Notice that

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the leg portions of the two individuals in the near field of view have been shifted to the right. This permits the wearer of my device to *know*, even when he is looking straight ahead, that there is something on his left - in this case a person - and to avoid walking into that person when, for example, he is contemplating veering to the left in an attempt to overpass the group of three people ahead.

The lower diagram of Fig. 2 represents what a person having left hemiamopia and wearing a system prepared according the teachings of Onufryk ('790) would see down that same hallway. I have prepared this diagram based on the design of the systems disclosed in Onufryk ('790), the design of the lenses produced by InWave based on the Onufryk patent (the upper photograph of the flyer, Attachment B), and my knowledge of the optics of prisms and the physics of vision. Notice that the wearer of this system looking straight ahead would have no warning whatsoever that there was an obstacle ahead on his left (the man). Furthermore, the view of the group of people in the distance would be distorted (in fact, part of the view will disappear).

11. I am aware that the company InWave Optics, Inc. has developed vision aids based on various inventions of Michael Onufryk, the inventor of the system disclosed in Onufryk ('790). This company promotes the system of Onufryk ('790) (the upper photograph of the flyer, Attachment B) to expand the *central* field of view of patients with various vision problems, including retinitis pigmentosa (tunnel vision). For hemianopia *per se*, InWave promotes a different system (the lower photograph of the flyer, Attachment B). The views of a person wearing the advertised

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InWave hemianopia aid are given in Fig. 3. The upper diagram shows that the InWave device promoted for hemianopia provides no help at all to a wearer having left hemianopia who is looking straight ahead. As shown in the lower diagram of Fig. 3, it is only when that wearer of the InWave device actually turns his eyes slightly to the left that he is given any warning of an obstacle on that side of him. (Such a warning would occur also without the device except that a smaller portion of the man on the left would be visible.) In addition, using this InWave device and looking slightly to the left, this wearer would now find his view of the group of three people down the hall distorted, with the loss of the person on the left of that group.

12. The specific placement of the prisms is another point of distinction between a system as taught by Onufryk and the system of my invention. In Onufryk's system, the wearer always looks through the prism with central (foveal, sharp) vision. The image quality through a prism is reduced with the increasing power of the prism; therefore, the power of a prism that can be used with the Onufryk design without distortion is limited. InWave uses prisms with no more than 12 prism diopters, providing about 6 degrees of image shift, in the Onufryk design. Others using similar designs have limited the power to no more than 20 prism diopters for the same reason. In my design, because the prisms are placed in front of the *peripheral* retina (the upper and lower periphery), where vision is naturally poor so that distortions will not be noticed as much, a stronger power prism can be used, providing the potential for much more image shift and field expansion. I have regularly used 40 prism diopters (providing

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about 23 degrees of field expansion) and have recently made prisms of 57 prism diopters, which provide as much as 30 degrees of field expansion. Such prisms would not be tolerated at all in the Onufryk design because they would be placed in front of the sharp vision of the central retina and would degrade that vision.

13. In summary, in a comparison of the system according to the invention, a system according to Onufryk ('790) and a system as marketed by InWave Optics, Inc., for those having hemianopia, only the system according to the invention provides any help in a straight ahead view for patients with left hemianopia. Thus, the physical differences between a system according to the teachings of Onufryk ('790) and a system having the limitations of the instant invention as claimed *are important* to the functioning of the respective devices.

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I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements so made may jeopardize the validity of the document, or application, or any patent issuing thereon.

Date _____

By _____
Eliezer Peli

356148.1

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Attachment A - Peli Declaration

Straight ahead view of a normally sighted person.

Straight ahead view of a person with left hemianopia.

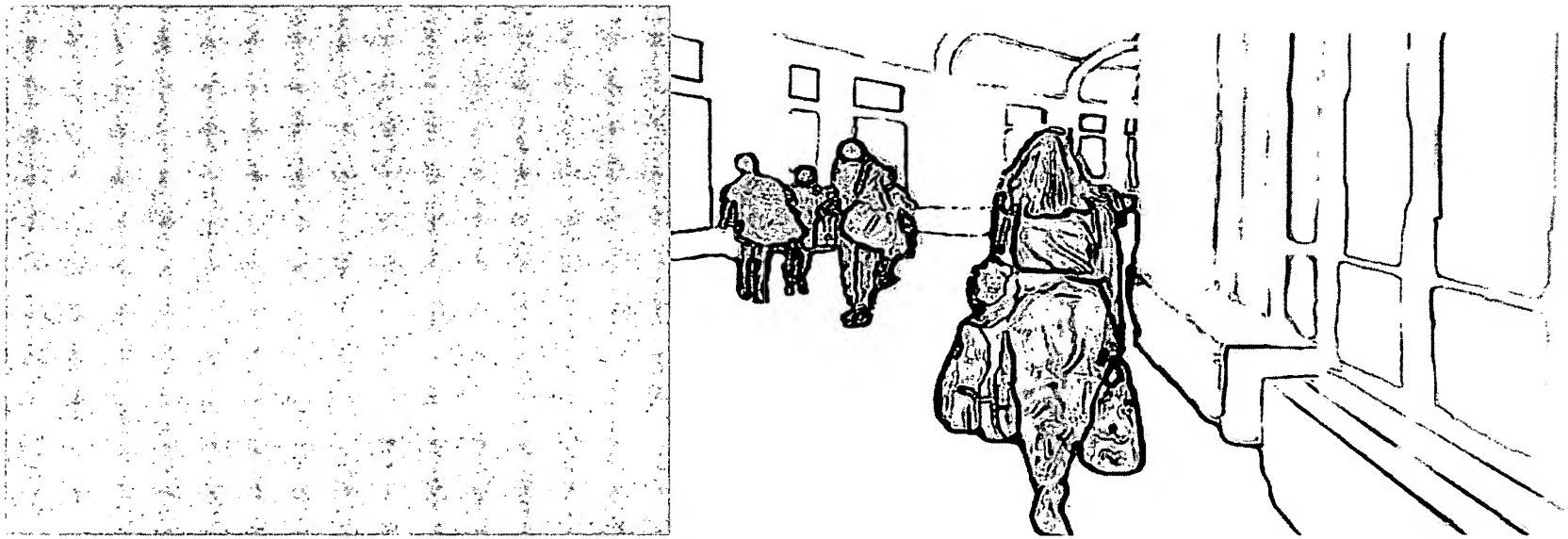
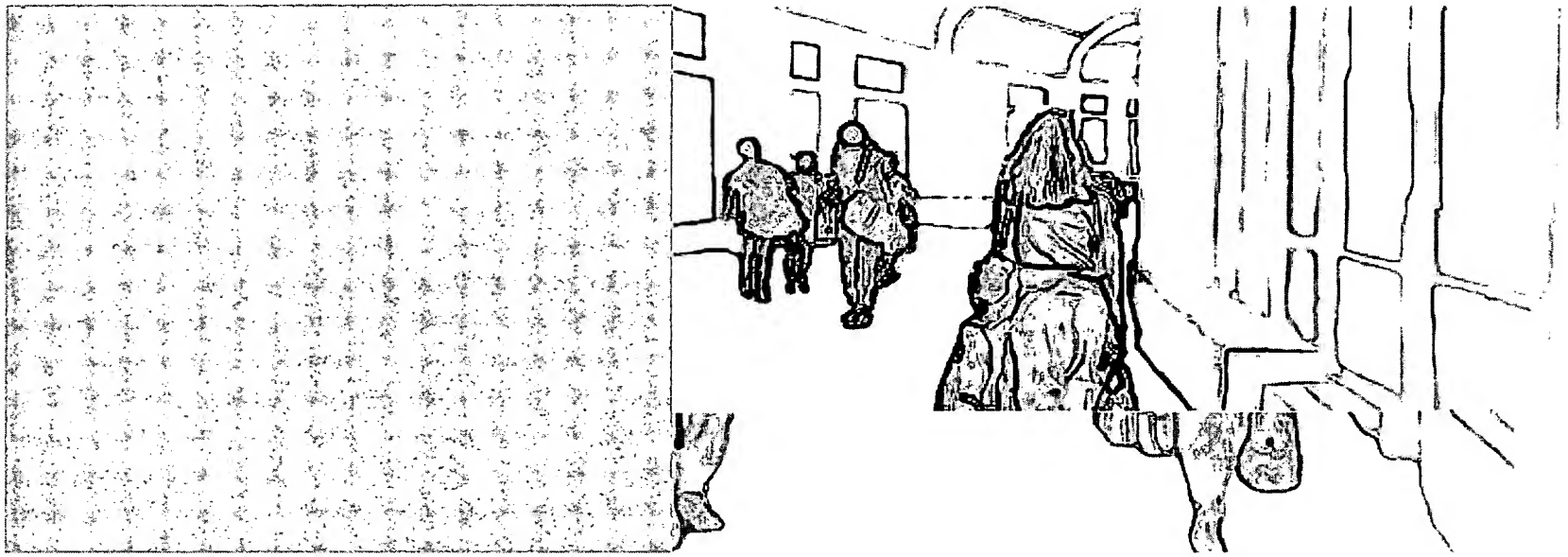


Fig. 1

View, with left hemianopia, wearing system of invention with lower prism.



View, with left hemianopia, wearing Onufryk (InWave) system.
Note loss of the middle person of the trio ahead (arrow).

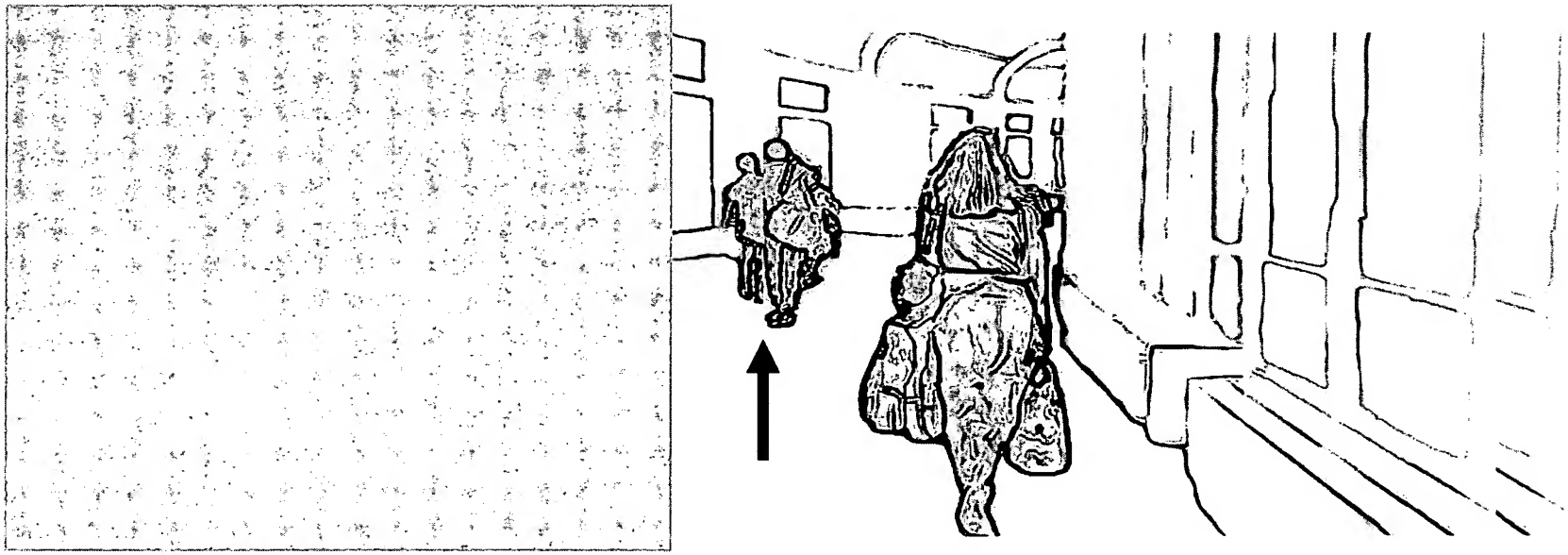
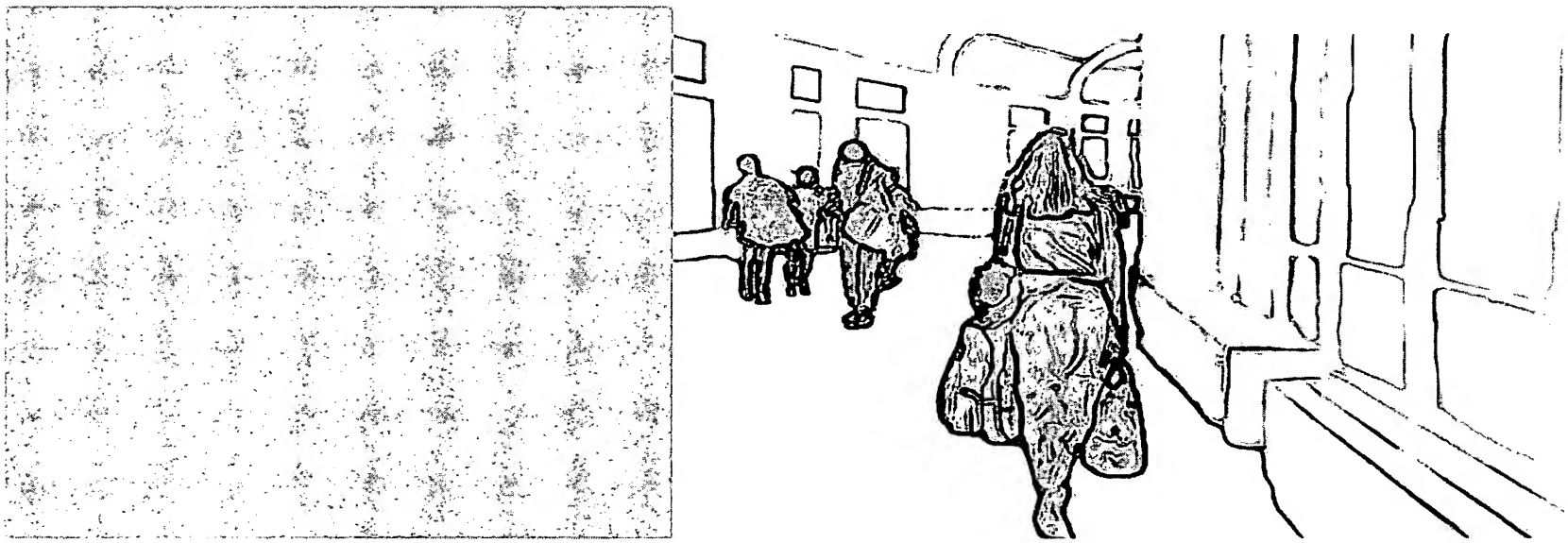


Fig. 2

View, with left hemianopia, wearing InWave hemianopia aid, looking straight (no effect).



View, with left hemianopia, wearing InWave hemianopia aid, looking slightly left.
Note loss of the left person in the small group ahead.

Fig. 3

View through a lens of the Onufryk system made by InWave for RP

Photo of the scene

Photo taken through an InWave Onufryk lens.
Note disappearance of the building on the skyline, part of the hotel on the right and the cars in the parking lot , all at apices of the prisms.

Fig. 4

View through the Hemianopia aid of InWave

Photo of the scene.

Photo taken through the InWave right hemianopic lens.
Note disappearance of the sign and half the pillar (arrow).

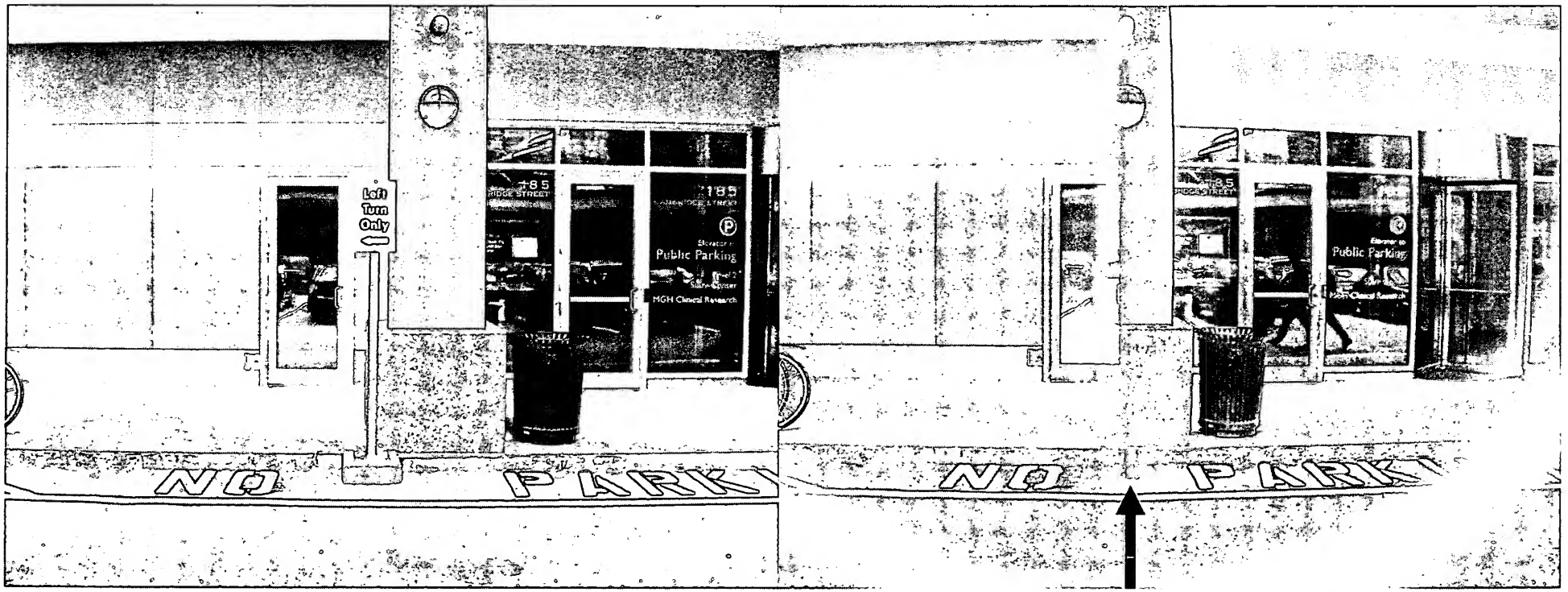


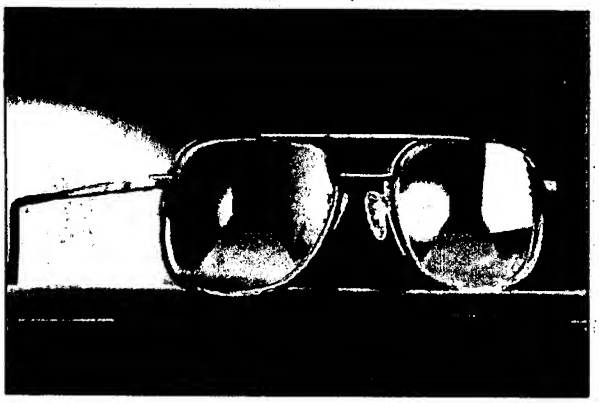
Fig. 5

Attachment B - Peli Declaration

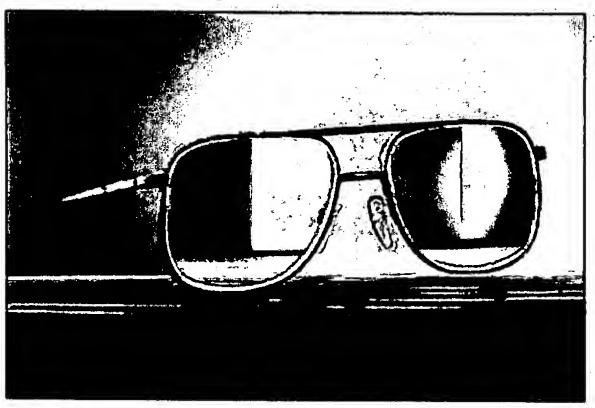
Field Expansion Prescription Eyewear

PO Box 5113
Janesville, Wisconsin 53547-5113

General Office	608.757.7135
Facsimile	608.757.7133
Toll Free	800.957.8400



Peripheral Field Loss



Hemispheric Field Loss

Field Expansion Prescription Eyewear

ield loss affects millions of Americans. lany suffer from tunnel vision or lost periph- al vision restricting mobility. Others cannot ad or drive a car due to a stroke or head jury. Many have blind spots and field loss at reduces their quality of life or leads to nctional disability. Inwave has prescription ewear that can help.

Inwave Optics Can Help

Inwave Optics introduces patented prism lenses incorporating optical quality prisms with a current eyeglass prescription. Inwave prism lenses allow individuals to see objects that are normally hidden. Inwave prism lenses direct light rays to functional areas of the eye, expanding the visual field of the patient.

Inwave Optics is dedicated to helping people with field loss. Our products are the result of over 17 years of research and development with the assistance of professionals, hospitals, associations and universities. Eyecare professionals diagnose the individuals field loss, determine the appropriate Inwave prism lenses, and then incorporate the individuals prescription. The result is exceptionally functional prescription eyewear that looks like standard eyewear and yields superior field expansion for the patient.

Inwave offers a **90 Day, 100% Satisfaction Guarantee**. Contact your eyecare professional to schedule an appointment to see if Inwave prescription eyewear can improve the quality of life for you or someone you know.

For further information:

Toll Free 1.800.957.8400
http:// www.inwave.com